TABLE IX.

Case.	Test-meal residue.	Gastric-juice residue.	Ratio.
4	20	150	1 to 7.5
	22	178	1 to 8.0
	16	99	1 to 6.0
	40	110	1 to 3.0

This case is interesting in that it shows that although there is pyloric stenosis, as shown by large overnight stasis of rice and rasins, the fluid test-meal residue may be small. Operation was refused and the lowering of the secretion ratio followed diet, medication, and systematic lavage. There was marked improvement in subjective symptoms corresponding with the fall of gastric juice secretion.

CONCLUSIONS. The demonstration of an alimentary hypersecretion is strongly suggestive of a chronic gastric ulcer. Whether a low ratio occurs in a case of ulcer of this type must be determined by future observations. How frequently alimentary hypersecretion occurs in conditions other than ulcer cannot be stated on this comparatively small number of studied cases. In a few instances we have found the gastric juice three times the amount of the test-meal residue. A ratio as low as this has proved the exception in those cases in which ulcer has been diagnosticated.

INTERMITTENT SPINAL CLAUDICATION.

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INTERMITTENT claudication may be divided into (1) the cerebral type, (2) the peripheral type, (3) the lumbar type, and (4) the spinal type. The arteries most commonly involved are the tibial, brachial, coronary, mesenteric, cerebral, and spinal arteries.

The chief cause is arterial disease, arteriosclerosis, senile calcification, obliterating endarteritis, acute arteritis. Not only are there organic changes in the vessel walls, but also an associated vasomotor neurosis, with a tendency to vascular spasm, which narrows the lumen of the vessels and diminishes the flow of the blood to the parts, with a resulting ischemia. Oppenheim recognized a benign purely functional type due to vascular spasm. Venous changes or diseases may give rise to symptoms of claudication similar to those in case of arterial disease. A secondary change follows in the nerve trunks and fibers as would be expected from impaired nutrition.

The predisposing causes are: (1) Exposure to cold and wet involving the anterior and posterior tibial arteries, (2) use of tobacco (Erb), (3) occupations such as that of marble-cutters who use the pneumatic chisel, and (4) senility. The exciting causes may be grouped under: (1) Syphilis, (2) acute infections, as influenza and acute endocarditis, and (3) alcohol.

It was shown in Charcot's[1] original observations in 1858 that with involvement of the large arteries of the lower extremity, intermittent limping, weakness, painful cramps, and paresthesia may develop in the extremities while walking, disappearing after a period of rest (paralysie douloureuse intermittente). The peculiar feature of this is the intermittent character of the symptoms, their appearance only during muscular activity, and their rapid disappearance in the passive state.

Erb,[2] in 1898, showed that more frequently the smaller ramifications of the arterial tree are involved with corresponding changes in the pulsations of the pedal arteries.

Williams[3] has reported a case of intermittent claudication involving an upper extremity. When the condition affects the upper extremities it is accompanied by numbness, the parts being cold, white, and painful, and resembling greatly one stage of the picture presented by Raynaud's disease. By resting and rubbing the hands the symptoms disappear. Frequently those afflicted in this way are obliged to change their occupation.

J. Ramsey Hunt[4] has recently described in a graphic manner the lumbar type of intermittent claudication. In this there is severe pain in the lumbar region, intermittent in character, occurring regularly during activity and ceasing after a short rest. A sufficent amount of blood is supplied during the passive state, which does not suffice, however, for the increased demand of the sacrolumbar mass during activity, hence the painful cramps and their peculiar intermittent character.

J. Dejerine[5] has described the type of intermittent spinal claudication. He states that the diagnosis from peripheral intermittent claudication depends on the absence of pain and circulatory disturbances and the presence of vesical and rectal symptoms—the condition being one of defective blood supply of the lumbar enlargement. The disorder is more common in males, one side being nearly always affected sooner than the other. The course may be rapid or insidious, but all cases tend to go on to spastic paraplegia if untreated. The organic reflexes are affected from the beginning. The most common symptom being precipitate micturition. The

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[1] Compt. Rend. et mém. de la Soc. de Biol., 1858, xii, 225.

[2] Deut. Zeit. f. Nervenheilkunde, 1898, Bd. xiii, S. 1.

[3] Jour. Nervous and Mental Disease, May, 1912, xxxix, No. 5.

[4] Amer. Jour. Med. Sci., February, 1912, cxliii, 2, 173.

[5] Rev. Neurologique, 1906, No. 8.

Babinski sign is usually if not always present. The ensuing paraplegia may resemble a hemiplegia, as the unequal affection of the two sides is common. The cause of the symptoms must be defective blood supply of the lumbar enlargement, as a result of which only sufficient blood is received for the physiological processes in the passive state, the supply being inadequate for the increased demands during activity. As there have been no cases of intermittent spinal claudication reported in the English language, so far as I know, I feel warranted in presenting these 2 cases:

CASE I.—T. B., aged forty-three years, married, native of Ireland. He was first seen September 10, 1910, and complained of weakness in his left leg and burning sensation and pain in the lumbar region of the back.

History of Present Illness: He noticed weakness in both legs three years ago; this came on suddenly while he was cutting grass. He was told he had sciatica. He continued working, but was compelled to stop from time to time on account of weakness and stiffness in his legs. The condition seemed to be worse in bad weather, and when he did a great deal of walking. He had a burning sensation in his back and at times cramp-like pains.

Past Medical History: He had the usual diseases of childhood, typhoid fever when aged twenty-one years, pneumonia at twenty-two.

Social History: He used alcohol to excess until three years ago. All venereal history is denied.

Family history is negative.

Examination of patient showed the pupils to be equal. Irides responded equally and well to light and accommodation. The knee-jerks were exaggerated. Both legs were spastic, but the left was more so than the right. No clonus was observed. There was slow hyperextension of the great toes when the soles of the feet were stroked (Babinski). No sensory changes were obtainable in any part of the body. Muscular power was somewhat impaired in the left lower extremity. Slight atrophy of the thenar and hyperthenar eminences was observed on the left side. The arm reflexes were all exaggerated, with the possible exception of the right biceps.

The patient came under my observation March 19, 1912. A diagnosis of intermittent spinal claudication having not as yet been made. From him I elicited the following: In January, 1912, he fell and broke his right humerus. Since then his left leg has been weaker and has bothered him considerably. When walking suddenly all power leaves the left leg and he falls unless he immediately receives some support. In a few minutes the power returns and he is able to go on his way. Some of the muscular power leaves his left arm when the leg gives way, and his left foot becomes cold. As the foot becomes warmer his leg feels better. He has good use of his right leg, but it becomes a little cold at times. On an average of once a day he has attacks in which his left leg jerks, the leg being flexed on the thigh, and is drawn up forcibly. The great toe moves backward and forward. This takes place lying or sitting; but if he gets up and bears some weight on the leg these movements stop. If he bears much weight on it, the leg suddenly gives way and he falls. Sometimes his back also feels weak, especially when the leg gives way. The left foot, when the attacks of weakness occur, feels as though it were swollen, but when examined it is found to be normal. Once in a while his left hand feels clumsy and he is unable to pick up various articles. In a short time this passes away and it feels normal.

After lying down and on awaking in the morning he can urinate with ease; however, during the day when up and around he has to stop and wait until the urine comes, then it dribbles, stops, then starts again, and the flow is fairly good, but he has some trouble in voiding the last few drops. The bowels are constipated. His leg always feels worse before a change in the weather, but after the change takes place it again improves. At times he has considerable itching on the sole of the left foot. At times the left leg and left arm are weak irrespective of each other.

In the physical examination the following facts are prominent: Eyes are normal. Throat is normal. There is no noticeable change in facial muscles and no impairment of sensation in the face. Thorax is normal. Heart and lungs are normal. Abdomen is normal. There is no impairment of sensation.

Dorsal Region: He complains of a sense of weakness in the region of the second lumbar vertebra. There is no impairment of sensation about the genitalia and anus.

Left Upper Extremity: Normal with the exception of numbness, which occurs in attacks daily, radiating from the shoulder to the fingers. Never any pain.

Right Upper Extremity: Negative.

Right Lower Extremity: Patellar reflexes are prompter than normal. In testing for the Babinski there is a slight hyperextension of the great toe when the sole of the foot is stroked.

Left Lower Extremity: There is moderate impairment (changeable in character) of muscular force and power. Muscles are somewhat poorly developed. He has considerable rigidity at times; this is not noticed when the patient has been in the supine position for some time, but is noticed after waking. There is no impairment of tactile, pain, heat, cold, and deep pressure sensations. At times he has the sensation of a drop of water running under the skin and suddenly bursting. There are no apparent tremors. Movements are free in all directions. At times the leg is as if dead, and if the patient desires to cross his knee with this leg, it must be lifted over. Patellar reflexes are exaggerated; this exaggeration varies and is more striking if tested after walking. The quadriceps extensor group can be seen contracting. He has no ankle clonus. There is a moderate amount of incoördination (heel to knee test). In testing for the Babinski there is a moderate hyperextension of the great toe when the sole of the foot is stroked. He had burning sensations in the left inguinal region two years ago, and not since.

The lower extremities were tested for changes in pain, and thermal sensations after exercise, but there was no impairment.

Gait: The patient holds the left leg as if stiff, and there is very little movement at the knee-joints in walking; the heels scrape on the ground.

Romberg's sign is negative.

Urine and blood examinations are negative.

X-ray examination of the spinal column is negative.

Wassermann reaction is negative.

Blood Pressure: Systolic, 90; diastolic, 50.

Case II.—J. W., aged forty-seven years, druggist.

His chief complaint is pain in the back, and in walking down steps he has severe pain in the knees. After walking for a few minutes his legs become stiff and powerless, and they drag, so that he must stop for a few minutes and rest, then he can proceed as at first. His present condition began in November, 1911, when he had pain in his back and general weakness. No venereal history is obtainable. He averages one alcoholic drink daily, and uses tobacco moderately.

Physical Examination: Pupils are unequal, the right being larger than the left, and somewhat irregular in shape. They react poorly if at all to light, but react to accommodation. Some slight swaying is present with eyes closed. Gait is spastic in both legs. Reflexes of the upper arm are slightly exaggerated. Power and motion are good. Legs are somewhat below normal in strength. Upon exertion he has violent trembling of his legs. Reflexes are all greatly increased in the lower extremities, but there is no ankle clonus. Doubtful Babinski is present in the left extremity. Some slight hypesthesia in indifinite areas is found in the lower extremities. Dorsalis pedis artery is not palpable on either side. Pulse (radial) is feeble and irregular. Some myocardial insufficiency is observed.

This case was seen in the medical dispensary of the University Hospital.

In conclusion, I desire to extend my thanks to Professor William G. Spiller for his kindly interest in this paper.